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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/405,328	09/24/1999	SANG-BUM KIM	678-362	9378

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EXAMINER

LE, LANA N

ART UNIT	PAPER NUMBER
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2684

DATE MAILED: 10/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/405,328

Applicant(s)

KIM ET AL.

Examiner

Lana Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 30 July 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-7 and 9-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14-20 is/are allowed.
- 6) ☒ Claim(s) 1,3-5,7 and 9-12 is/are rejected.
- 7) ☒ Claim(s) 6, 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

RESPONSE TO AMENDMENT

Response to Arguments

Applicant's arguments filed 07/30/2002 have been fully considered but they are not persuasive. Regarding independent claims 1 and 7, applicants argued that the limitation "wherein the different search conditions include phases and search periods corresponding to a plurality of PN sequence phase search starting points" is not disclosed by Blakeney, II et al or Naruse et al. However, even though the cited references do not explicitly disclose the limitation, Naruse et al disclosed phase conditions by figure 6 in which phase change of the PN code is shown by gradually shifting the phase chip by chip from its initial phase (col 7, lines 40-47, lines 60-63; col 8, lines 25-28), the search periods are analogous to the search widths that is to be specified by the control circuit 13 (col 7, lines 25-26); and phase search starting points are the initial reference phase points in which the PN search operation begins (col 8, lines 25-28; col 7, lines 40-46). Even though Naruse et al discloses one searcher for illustration purposes, Blakeney, II et al discloses that several searchers (fig. 6) are possible in a multi-sector base station, and each searcher element, one of 402A-402N, is assigned by a controller 400 to search to a mobile's information signal and report back to the controller for assignment of the demodulation elements (col 18, lines 35-51). Therefore, the combination of Blakeney II et al and Naruse et al would make an obvious integration in which more searcher elements are used for the different search conditions of Naruse.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-5, 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blakeney, II et al (US 5,490,165) in view of Naruse et al (US 6,263,010).

Regarding claim 1, Blakeney II et al discloses a PN sequence phase searching apparatus in a multi-carrier CDMA mobile a communication system, comprising:
at least two PN sequence phase searchers 402A and 402B (figure 6) for searching for the PN sequence phase of one of at least two different band input signals using a plurality of different assigned search conditions and for outputting PN phase and energy information (col 18, lines 57-65); and
a controller 400 for assigning the plurality of different search conditions to the at least two PN sequence phase searchers (col 18, lines 43-51);

Blakeney II et al fails to disclose further the apparatus determining a minimum phase variation period based on the PN phase and energy information received from the PN sequence phase searcher. Naruse discloses for determining a PN variable search width according to the propagation delay time

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difference based on the PN phase and energy information received from the phase searchers (col 7, lines 23-40; col 10, lines 49-60); and different search conditions include phases and search periods (col 7, lines 25-26) corresponding to a plurality of PN sequence phase search starting points since each phase searcher must start its search at a different point on the corresponding sector (col 7, lines 34-46; col 8, lines 25-29). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a variable PN minimum phase period and have specific search conditions such as search periods to the different searchers of Blakeney II et al in order to identify and determine the optimal search width value in each searcher element based on the propagation delay time difference corresponding to various sector sizes in which synchronization acquisition can be acquired in a short time due to offset value information.

Regarding claim 3, Blakeney II et al discloses the PN sequence phase searching apparatus of claim 1 wherein different search conditions are assigned to the at least two PN sequence phase searchers 402A and 402B by dividing a PN sequence (col 8, lines 4-20) by the number of the PN sequence phase searchers 402A-402N (figure 6; col 18, lines 35-51). Blakeney II et al didn't further disclose a plurality of PN sequence phase search starting points. Naruse et al further discloses a plurality of PN sequence phase search starting points (col 7, lines 34-46; col 8, lines 25-29).

Regarding claim 5, Naruse further discloses the PN sequence phase searching apparatus of claim 1, wherein the phase searcher perform a PN

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sequence phase search within a minimum phase variation period determined by the controller. Naruse didn't disclose at least two phase searchers. Blakeney II et al discloses at least two phase searchers (Figure 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add more phase searchers in order to speed up the searching process for the multiple band signals.

Regarding claim 7, Blakeney II et al discloses a PN sequence phase searching method in a multi-carrier CDMA mobile communication system, comprising the steps of searching for the PN sequence phase of one of at least two different band input signals in parallel using a plurality of different assigned search conditions; outputting PN phase and energy information (col 18, lines 43-65). Blakeney didn't disclose determining a minimum phase variation period based on the PN phase and energy information. Naruse discloses determining a minimum phase variation period based on the PN phase and energy information (col 7, lines 23-40) and wherein Naruse further discloses the plurality of different assigned search conditions include phases and search periods (col 7, lines 22-26) corresponding to a plurality of PN sequence phase search starting points since each phase searcher must start its search at a different point on the corresponding sector (col 8, lines 25-28; col 7, lines 40-47). It would have been obvious to one of ordinary skill in the art at the time the invention was made for the different search elements of Blakeney II et al to find the minimum phase variation period and to have different search conditions such as search periods and phase starting points in order to determine and set the search width value

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corresponding to various sector sizes by correlating the phase-shifted short code with the pilot code of the pilot signal's time difference in which the search width is determined from.

Regarding claim 9, Blakeney II et al further discloses the PN sequence phase searching method of claim 7, wherein the plurality of different search conditions are set by dividing a PN sequence (col 8, lines 12-17) by the number of the parallel PN sequence phase searchers via search elements 402A-402N (col 8, lines 35-51). Blakeney II et al didn't further disclose assigning corresponding phases produced by the division as the PN sequence phase search starting points of each phase searcher. Naruse et al further discloses assigning corresponding phases produced by the division as the PN sequence phase search starting points of the phase searcher (col 7, 22-26).

Regarding claims 4 and 10, Naruse further discloses the plurality of different search conditions are set by dividing a PN sequence into predetermined periods and stored in the PN period holding counter 234 and the divided search periods T1-T3 are sequentially assigned to the at least two PN sequence phase searchers (col 9, lines 36-50).

Regarding claim 11, Naruse further inherently discloses the PN sequence phase searching method of claim 7, wherein the minimum phase variation period is determined by phase information corresponding to the highest energy.

Regarding claim 12, Naruse further discloses the PN sequence phase searching method of claim 7, further comprising the steps of:

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searching for the PN sequence phase of each input signal within the determined minimum phase variation period (col 7, lines 23-40); and transmitting PN sequence phases acquired in the search to an upper processor, after the minimum phase variation period determining step (col 7, lines 53-59).

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance:

Regarding claim 14, the cited prior art Blakeney PN sequence phase searching method in a multi-carrier CDMA mobile communication system, comprising the steps of: searching for the PN sequence phase of one of at least two different band input signals in parallel on a plurality of assigned different search conditions and outputting information about PN phases and energies; Naruse further discloses sorting the energies of each searcher and comparing each max energy with a threshold varied with the number of PN sequence phase searches; assigning new corresponding search conditions to PN sequence phase searchers satisfying the threshold, and performing the PN sequence phase search with the new search condition if max energy satisfy the threshold and determining a minimum phase variation period based on the PN phase information.

However, the cited prior art fails to disclose further:

repeating the same process as upper case the predetermined number of times if max energy and frequency error satisfy the corresponding thresholds;
determining a minimum phase variation period based on the PN phase

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information, if there's a PN phase which satisfies all of the conditions; assigning another search condition which includes another search window size and starting point to the PN sequence phase searchers which does not satisfy a threshold and resume PN phase search if max energy or frequency error does not satisfy the thresholds at any stage.

2. Claims 6 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lana Le whose telephone number is (703)308-5836. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Hunter can be reached on (703)308-6732. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-7314 for regular communications and (703)308-6306 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

Lana Le

October 9, 2002

Uhefr
10/18/02
Don